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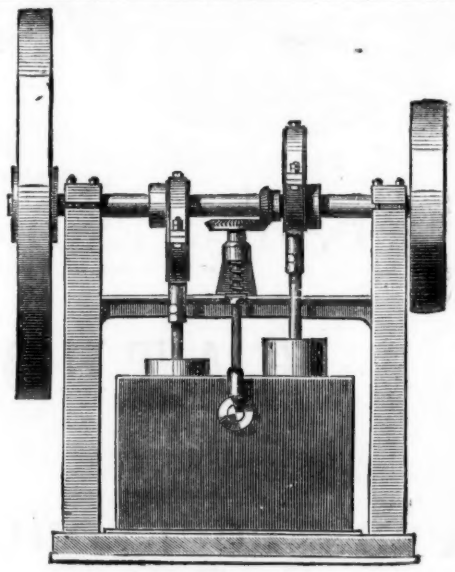

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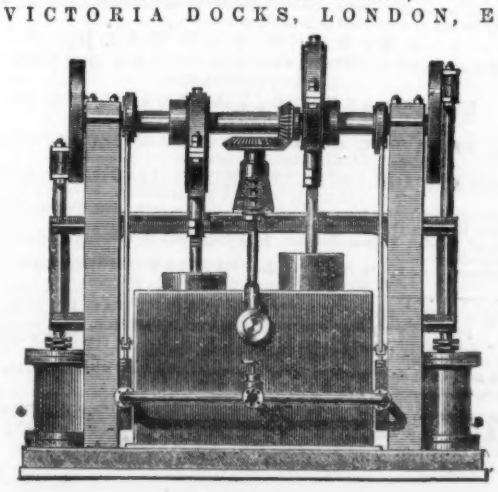

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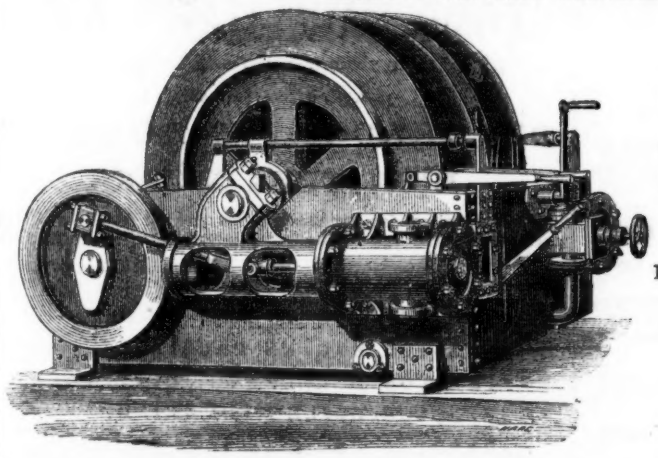

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Original Correspondence.

TREATMENT OF SULPHIDES.

SIR,—In reply to "Cuprum's" letter inserted in last week's Journal, I would wish to remind him that he has started on erroneous premises, or rather a very cramped view, in his criticism of Mr. Hollway's process. The great field for this process not being intended so much for the working of pyrites in England and other places where every constituent in the mineral is of marketable value, and can be sold at remunerative prices, although it may eventually prove of utility as an economical auxiliary process in some branches of the existing copper smelters' establishments, but the immense field of operation will be abroad, notably America, in districts where fuel is either not to be had, or if it is, at too high a price to be available. In such places it is well known that there are enormous quantities of pyrites rich in sulphur and iron containing gold, silver, and copper in small proportions, either together or separately, which at present are valueless on account of the great cost of fuel and carriage, and when concentrated by this process can be sent into the market yielding a large profit, and in such cases the sacrifice of the sulphur and iron is not of much importance. But the fact is that at present it is agreed by all who have witnessed Mr. Hollway's experiments that it is possible by his process to collect about one-third of the sulphur in the metallic form, and no doubt when perfected this quantity can be increased. But supposing "Cuprum" to utilise all the sulphur in these immense quantities of pyrites, with the present market demand sulphur would be no longer worth 5*l.* to 5*l.* 10*s.* per ton; besides which even if it remained at this price it would cost in most cases much more than its value in cost of carriage to bring it to a market. As your correspondent hails from the same town as myself, and no doubt we are known to each other, I should like rather than trouble you with too long a letter to talk the subject over with him if he thinks well to appoint a meeting.

I know nothing of Mr. Cobley's process, but from your correspondent's description I should consider it much too costly and complicated, even if theoretically correct, to be a commercial success, but should be glad if "Cuprum" would kindly give me the number and date of Mr. Cobley's specification of his patent, that I may obtain and peruse it. The precipitation of some metals by electricity is being done, I believe, successfully in a few places, and I am quite of opinion that electrolysis is destined in future to take a prominent position in metallurgical operations, but the solutions must be prepared in a simple manner, and at a small cost.

Swansea, July 2. J. S. MERRY.

TREATMENT OF COPPER SULPHIDES.

SIR,—With reference to the letter from your correspondent "Cuprum," in last Saturday's Journal, I would suggest that he hardly increases the value of his favourable opinion on Mr. Cobley's process by depreciating, in such an illogical way, another process that has been so favourably considered, not only by eminent chemists but by practical copper smelters. Your correspondent alleges that in the Hollway process "sulphur worth 5*l.* 10*s.* per ton is burnt as a substitute for coal which can usually be obtained at 1*l.* per ton. This is not a fact, for in the first place the sulphur as it exists in the ore is not worth 5*l.* 10*s.* per ton, which is the extreme value of sulphur after undergoing the expensive process of extraction and refining; secondly, iron as well as sulphur is a combustible ingredient of the ore; and thirdly, the sulphur, although partially burnt, is not thereby necessarily wasted, but can be afterwards utilised for the manufacture of sulphuric acid.

Without criticising Mr. Cobley's process, I would point out that he also burns sulphur to form sulphate, but "Cuprum" does not in this case make the objection as to this sulphur being "worth 5*l.* 10*s.* per ton"; the fact is, such an objection in both cases is a simple illusion, and can only be honestly made through a misconception, as in all cases of smelting sulphides the sulphur has to be burnt, or otherwise eliminated, before the metal can be obtained. It is somewhat surprising that a Swansea metallurgist should attach so much importance to burning the sulphur, it being notorious that in that district, with, I believe, only one exception, the whole of the sulphur contained in the ores smelted is burnt to waste.

There are two other statements of your correspondent to which I must refer—that Hollway's process is "applicable only to sulphides," and that these are only, "perhaps, one-fourth of the ores raised." I, however, believe it to be a fact that by far the greater proportion of copper ores now treated are sulphides or arsenides, and Mr. Hollway asserts that the surplus fuel contained in such ores can by his process be utilised for smelting other ores, such as silicates, carbonates, and oxides. Your correspondent "Cuprum" states that the spoil banks would be increased by the adoption of the Hollway system, but this opinion is evidently not shared by many competent authorities.—*London, June 30.* CHARLES KING.

TREATMENT OF CUPREOUS SULPHIDES.

SIR,—I have read carefully the letter from "Cuprum" in last week's Journal, and I could scarcely think it possible that anybody would criticise a metallurgical process and betray such a woeful amount of ignorance of his subject, more especially in your valuable Journal, where it will be read by people who know at least something of metallurgy, chemistry, and mining, and I fancy the greatest evil I could wish him would be that he would append his name. When people write anonymously, however, they have usually a reason for it. When we are coolly told that the sulphur which is oxidised in the Hollway process is worth 5*l.* 10*s.* per ton, while the very same sulphur when treated by the process of Mr. Cobley, of Dunstable, is worth nothing at all, indeed, is a nuisance, to get rid of which it is worth while spending some money, one feels inclined to adopt a thorough English fashion of arguing, and to "swear roundly at him." May I be permitted to inform him of a few facts connected with the Hollway process and copper extraction generally.

The Hollway process (I hope "Cuprum" has read that gentleman's pamphlet) was devised for the purpose of utilising "spoil banks" for the utilisation of ores too poor in copper, &c., for the present mode of extraction; and for the extraction of sulphur from ores, the sulphur of which is at present wasted and of no value, and the burning of which is a nuisance, and must ultimately be put down by the Spanish Government; and if it cannot fulfil those conditions it will be of no value, and must be a failure. This has been repeated again and again, and "Cuprum" will save a great deal of trouble if he will kindly remember it. Mr. Cobley has, he tells us, "patented a process which, far from burning up the valuable sulphur contained in the pyrites by the judicious (?) application of electricity will secure the whole of the constituents in a merchantable condition." Well, really! In the Hollway process considerably more than one-half of the sulphur (three-fourths will not be understating the figure) is recovered as sulphur, and the heat is got not so much by burning sulphur—as "Cuprum" fondly imagines—but by burning iron. Cobley only gets one atom—*i.e.*, one-half—of the sulphur, while the heat is produced at the expense of the usual amount of coal, to save which the Hollway process was devised.

Hollway gets a regulus containing (say) 40 per cent. copper, while Cobley only gets, well—a roasted mass. This mass is roasted to form sulphate of copper, as if it was the easiest thing in the world to form sulphate of copper by simply roasting; this is dissolved in dilute acid, or the solution may be evaporated till it gets into a pasty mass, or *aplattises*, and as these contain matters which "obstruct electrolytic action," they also must be calcined, and again dissolved, when it is fit for the electrical deposition of copper. He also finds it necessary to use a sulphate of soda or alumina to convert the sulphurous acid into sulphuric acid, and "through which a current of electricity is conducted until the acid is present in considerable quantity." Truly there are still some heads which require Sydney Smith's celebrated operation. "Cuprum" also tells us "That as much of the process is worked by the by-product the cost is insignificant;" but electricity is not a by-product, neither is sulphate of soda or alumina. In fact, the only by-product is the sulphurous acid, and as it is made into sulphuric acid by a most wasteful, expensive, and doubtful method, he must not expect your readers to swallow the assertion that "Mr. Cobley's process has inestimable advantages over that which has recently been so eulogised." I may say that the Tharsis and other companies find that it is very much cheaper to precipitate the copper with scrap-iron than by means of electricity, however judiciously they may apply it.

Sheffield, June 30. WILLIAM GALBRAITH.

UTILISATION OF SULPHIDES AS FUEL.

SIR,—Being in England on a visit, I saw in last week's Journal a letter from my friend Mr. Blanchard, of the Bottino Mines, Serravezza, Italy, in which he speaks of the advantages of Mr. Hollway's process for utilising sulphides instead of fuel for the reduction of metals, and I cannot help adding my testimony to that of Mr. Blanchard's as to the enormous advantages it offers to mining industry generally. There is no doubt it will be of great importance to the mainland of Italy, but I am sure it will be much more so to the Island of Sardinia, where, as well as in Italy, my experience extends over more than 25 years, and I, therefore, can give a clear opinion of its advantages, knowing as I personally do of more than 100 mines in Sardinia, all of them without the means of concentrating the metals contained in their ore. In that island there exist enormous deposits of mixed galena and blende ores; for instance, at the Monte Rosas and La Lilla and Parredis Mines there are thousands of tons of these ores which have actually been raised, and although containing 26 per cent. of lead, 30 per cent. of zinc, and 0·02 per cent. of silver have been abandoned, not having been found profitable for treatment by ordinary methods. In Belgium such ores are treated, but the cost of transport from these mines is too great to permit them to be sent to that destination.

At Barisonis and Spilumcarqui there are also vast deposits of cupreous pyrites containing a high percentage of lead and blende, which have also been abandoned, and at the latter mine there are over 2000 tons of these ores lying unutilised, and they are peculiarly suitable for treatment by the Hollway process. In fact, throughout Sardinia there are many mines where the process could be advantageously employed, and I look upon this invention as likely to be of the utmost importance to a large number of properties which cannot, under the present system, be advantageously worked, and it will sooner or later infuse fresh life into innumerable affairs now languishing for want of an economical means of reducing the valuable metals stored up in the minerals which actually contain their own fuel for treatment by the Hollway process.

GEORGE JOHN BROWN, C.E., of Leghorn.

Ironmonger-lane, June 27.

SHEFFIELD PIG-IRON, AND COPPER SULPHIDES.

SIR,—Not the least astonishing result of the dephosphorisation of Cleveland pig-iron is the exposure of the ignorance which exists amongst ironmakers of the technicalities of their own business. Metallurgical chemists are daily pestered with enquiries as to whether steel can be made from pig-iron manufactured in this district or in that. One smelter asked if it was possible to have a sample lot of his pigs converted into steel by this process, in order to assure himself that his product was suitable; another emphatically asserts that his pig-iron made from all oolitic ore will do, but that his neighbour's will not, as it is made from a mixture of forge cinders and oolitic ore, and that the loss in the Bessemer converter will consequently be heavier. It really appears necessary for some one to remind iron smelters that iron is iron all the world over, and that pig-iron made how and where from what you like is nothing more nor less than an admixture or alloy of pure iron with varying amounts of other elements, all or any of which may be removed by various well-known processes. Your correspondent, "An Observer," has evidently read a letter, or a copy of a letter, signed "B.," which appeared in a Sheffield daily paper some time ago, wherein a statement was made that pig made in that district contained only one-third of the phosphorus which exists in Cleveland pig. This statement is simply untrue. I am in a position to assert, and to prove my assertion, that no pig-iron made within a radius of 50 miles of Sheffield from the oolitic ores of Northamptonshire, or from those of Lincolnshire, with or without an admixture of forge cinders, contains less than 1·00 per cent. of phosphorus; in fact, South Yorkshire, Derbyshire, Lincolnshire, and Northamptonshire pigs contain, on an average, 1·25 per cent. of phosphorus, as against an average of 1·50 per cent. in Cleveland pig. I have, however, some doubts as to whether the margin is so great as this. Of course, it must be understood that I do not refer to special iron made from pure minerals, which can be made in any district; in fact, pig-iron is being made in Sheffield to-day with but 0·05 per cent. of phosphorus for a special purpose.

It would be amusing, if it were not pitiful, to enumerate the various opinions which have been spoken or written on the process of Messrs. Gilchrist and Thomas, as well as of Mr. John Hollway. While they have met with a warm and hearty support from our most advanced metallurgists, they have, on the other hand, met with virulent opposition and sneers. But such *couleur de rose* statements as we have read in the daily Press of late on the subject of dephosphorisation of iron do more harm than all the dirt which interested parties can fling. It is really difficult to keep silence when such statements are given to the world. Those who really understand the matter cannot refrain from contradiction.

The letter of your correspondent, "Cuprum," comes under the same category as that of "An Observer." I cannot understand how any practical man can advocate a wet process when a dry one is available; or, what is more incomprehensible, that anyone having the slightest idea of prime cost could advocate an electrolytic process when any other method whatsoever may be employed. Does "Cuprum" expect, Sir, that any sane smelter would swallow such a dictum as this—"The cost is insignificant." I have smelted metals all my life, but never yet could sit down and fold my hands with such a happy-go-lucky feeling as this.

It really is unwise to advocate the use of such complicated and costly processes as Mr. Cobley's in disparagement of Hollway's—more especially when the best the advocate can say is that the patentee proposes to do so and so. Mr. Hollway never came before the metallurgical world with such a statement as that. I think I need scarcely point out that an ounce of practice is worth a ton of theory, or that Mr. Hollway's stock of practical experiment is certainly not to be expressed in ounces. HIERRO EN LINGOTE.

Sheffield, July 1.

RICHMOND MINING COMPANY.

SIR,—The severe remarks in last week's Journal on Mr. Rickard's conduct in reporting on the Ruby Consolidated property are unfair to him because he does not occupy his original position under the company, as you will clearly see from the following evidence which he gave to the committee in October, 1877:—"I was engaged by written contract at a salary of $10,000 a year; that contract was altered about June or July, 1876. I then engaged to take $420 a month. No notice is now required to either party to annul the (monthly) engagement. When I first took the company's service I was under engagement not to touch anything outside of the company. After I had my pay reduced I considered my hands were untied, and Mr. Probert told me the same thing, and I considered it my duty to myself and family to help myself. I am interested with Mr. Wren (the President of the Nevada Richmond Company and their legal adviser) in a small mine in Secret Canon; it is the Jones Mine. We may have supplied about 20 tons of ore from this mine to the Richmond. I am not aware that Mr. Probert knew that I and Titus (the timekeeper and clerk of the Richmond works) were supplying fluxes to the Richmond. If the committee think it wrong for me to be interested in this manner I am quite willing to give it up."

Mr. Rickard was perfectly frank and straightforward in his statements and replies to the committee concerning these business irregularities, all of which were made fully known to the London board in 1877. The company's trustees in Nevada being indirectly interested in the expenditure—Mr. Wren, the President, in all legal suits, Mr. Probert in the refinery, and Mr. Price in the purchase of stores, &c.—had no doubt a demoralising influence on the company's employees; hence it was not surprising that the committee found the company's manager interested in fluxing ores, &c., the clerk of the works also, and the charcoal receiver actually furnishing charcoal and giving receipts.—*June 30.* R. M. BRERETON.

THE RIO TINTO COMPANY.

SIR,—The profits of the Rio Tinto Company for 1878 were sufficient to pay all fixed charges, so that any improvement this year will be available for dividend on the ordinary shares. The produce of cementation copper was stated by the Chairman at the meeting to have now reached 155 tons weekly, or (say) about 8000 tons a-year, and, as last year it amounted to only 4416 tons from this source alone, a large surplus will be available for dividend; but, in addition, the company will this year receive 6d. a unit instead of 5d. for sulphur, and, as expenses are now much reduced and all the materials required for the company's use, such as pig-iron, &c., can now be had at very low prices, I anticipate a dividend on this year's working of something like 5 per cent. The Tharsis 10*l.* shares are now selling at 23*l.*, and the prospects of that company, in my opinion, are inferior to those of the Rio Tinto, the 10*l.* shares of which are now selling at about 4*l.* 5*s.*

A RIO TINTO SHAREHOLDER.

RUBY CONSOLIDATED MINING COMPANY.

SIR,—The high character of the *Mining Journal* is so well established that it would take a great deal of mischief to shake it, otherwise the sort of escapades which one of your contributors permits himself to perpetrate in connection with the affairs of the Ruby Mining Company would certainly be looked upon as being inspired by suspicious motives. In last week's Journal there are about as many incorrect statements as words contained in the paragraph referring to the affairs of this company. The Ruby Consolidated is not as yet registered—as he says it is—under a new name, although it is going to be so registered when certain formalities are complied with. The new shares are not, as he says, offered for sale by certain dealers, for the simple reason that the company has not a single share unallotted. The number of bargains on the Exchange is limited, as every honest broker will tell you, by the scarcity of sellers, which is easily enough understood, considering that those shareholders who have waited for more than five years are not likely to throw away their shares now that success is assured. Finally, the writer throws doubts upon the honesty of the Chairman and the directors, by insinuating that they may have got up a report by one "Rickard," and then misrepresenting this Rickard as the manager of the Richmond, which of course he is. This insinuation is so serious that if I were the Chairman of the Ruby I would certainly not allow it to pass without requiring the publication of an explanatory letter. I am fully aware that the chief editor of a paper such as yours cannot possibly check every statement contained in the Journal, but he ought not to allow perpetual attacks on a company made by interested persons, and very likely for the purpose of causing disreputable market operations. A LARGE SHAREHOLDER.

RUBY MINING COMPANY.

SIR,—The ways of "British Investor" are really inscrutable, and all lessons of the past seem to be thrown away upon him. It suffices that a couple of speculators rush up a stock like "Mexicans," then promulgate a lot of absurd rumours, and in steps the public to take off the stock from the speculator's hands at the inflated prices. On the other hand, here are the shares of a mining company, the property of which is known to be nearly the most valuable on the Pacific Coast, and which is now in the absolute undisputed possession of the company, but the public allow a few knowing speculators to pick up the shares at 2*l.* or 3*l.* pre-paid, I have no doubt whatever to make a rush at them at 10*l.* or 12*l.*, as usual. Anyone who will compare the situation of these mines, and form his own opinion about their immediate future, but, of course, if investors instead of taking some trouble will blindly follow the lead of speculators they must not complain if they lose their money.

Fenchurch-street, July 4. ONE WHO KNOWS.

FLAGSTAFF SILVER MINING COMPANY.

SIR,—I cannot understand by what process of reasoning a "Large Shareholder" has arrived at the deductions, so emphatically urged on his brother unfortunates, to place their entire confidence in the directors and the committee (late). He does not impugn the verdict of the Supreme Court at Washington in the Tarbet suit, which declares the Flagstaff Company to have been working for years past outside its boundary lines, practically confines the ore-bearing ground it once possessed to 100 ft. on the lode, besides mulcting the company of the trifling sum of 9000*l.*; but he writes that there is hope still for the shareholders, as the suit was brought into Court without the knowledge or sanction of the company or of its legal adviser in Utah. If this be so, were the directors and officials of the company committing perjury when they swore in their affidavits in the Chancery proceedings in December and January last that they had not only sent out sums of money to Mr. Beattie to defray the expenses of the appeal to Washington, but had instructed him to take the necessary steps for immediate procedure?

I opine that verified copies of such affidavits (which were really filed in the Courts here) would be quite sufficient evidence of the company's consent for the Supreme Court at Washington to adjudicate on what is technically phrased here printed argument. Did your correspondent learn at the office that it was the "legal adviser's" opinion that Mr. Woolworth, the counsel acting on behalf of the company, argued most powerfully against the Tarbet claim, as it was of the utmost importance to his real client—Mr. Davis—that the untoward decision of the Courts at Utah should be reversed on appeal? Did he also learn that the "legal adviser" had frankly stated that the judgment, apparently so calamitous, was not to be regretted, as it practically cancelled Mr. Davis's claim against the company for 70,000*l.*?

If these facts were not also imparted to the enquirer, I am afraid it is suggestive that the same system of suppression of all information to the shareholders must be continued just a little while longer. Having had conversations with Mr. deMetz, on the subjects referred to, I feel warranted in stating that the secretary of the company was not the source of a "Large shareholder's" information. It is inexact to state that the committee were "specially elected by the shareholders in general meeting as an additional watch over the shareholders interests." They were appointed to confer with the directors in furthering certain financial arrangements (*vide* resolution), and "Shareholder" must not be annoyed if I assure him he has been the victim of intentional deception in stating that there is concerted action on the part of the directors and the committee for the purposes named by him. There is no committee, its functions have long since ceased, and the members repudiate its existence. As for the directors, they are only required to do a simple act of justice, and call a meeting of the shareholders. There was no annual general meeting held last year, and the time has long since elapsed when the shareholders should have been called together by right this year, but the mountain gives no sign of parturition. Each late committeeman, as individual share or debenture holder, can even now by that united action urged by you, Sir, and in the manner indicated in your columns week after week save something from this cruel catastrophe, and they and the debenture-holders have been repeatedly solicited to avail themselves of the proposals made by the present owners of the Flagstaff Mines (and of other adjoining claims on the Flagstaff lode) through the trustee of the debenture-holders to re-acquire the valuable property of which they have been so unjustly deprived.

These proposals should have been long since accepted, and a new company should have been formed months ago to work these consolidated mines. During the past six years over 90,000 tons of ore have been smelted or sold, yielding over 1,000,000*l.* sterling, and but for the most glaring mismanagement, and equally as conspicuous dishonesty, the Flagstaff shareholders should have been throughout the recipients of large dividends. The property is now being worked by an influential American company. The latest advices received from Salt Lake assure us that the mines are practically inexhaustible, and can by good management be made even

more productive. Will the shareholders, succumbing to naked facts, consent to have the company wound up? Will the share and debenture holders join cordially together in assisting their trustee, Mr. Pearson, and empower him to accept the proposals made to them, through him, for the acquisition of the old Fagstaff Mine and other adjoining claims (forming one grand mining property) at a price estimated at *one third less than the company's actual indebtedness?* These are the points now awaiting the shareholders' decision; and already intimation has been given that the above offer *will only stand for a limited time.* In conclusion, I would, like a "Large Shareholder," caution the share and debenture holders not to "give heed to the movements of outsiders." LEN.

THE NEW QUEBRADA COMPANY.

SIR,—At the meeting of the New Quebrada Company, held last week, a shareholder asked the Chairman what prospect he could hold out of a dividend, and, considering his position, he very properly answered in a generally hopeful manner. But it appears to me that shareholders can now very well estimate this for themselves. They know that the output has reached the large quantity of 12,000 to 13,000 tons of good ore per annum, and it is only the unprecedentedly low state of the copper (like all other) markets which prevents large profits being realised, and that a merely fractional increase in the value of copper would extinguish such a small comparative deficiency as last year's, and have a large surplus, besides which both the quantity and quality are steadily increasing, so I think they must feel certain that in one or all of these directions a large profits will soon be made, and the end of our "long lane" at length reached, and I trust shareholders will hold firmly their shares for a few months longer at all events, when I feel convinced their patience will be well rewarded. A SHAREHOLDER.

Lloyd's, July 4.

CANADIAN MINING NOTES—No. XXV.

SIR,—My last letter gave you the report of the resolutions introduced in the House of Commons by Dr. Tupper with regard to the Canada Pacific Railway. But Dr. Tupper has justly received the reward of his political services, and, on May 24, was told by His Excellency the Marquis of Lorne, acting under authority from Her Majesty the Queen, to "Rise up, Sir Charles Tupper." He was on his knees, and at the same time that the Marquis pronounced those remarkable words he hit him on the shoulder with a drawn sword. He did rise—he did not stay on his knees any longer. Together with him, and at the same time, the following knights were created—Sir Samuel Tilley, Sir Richard John Cartwright, and some others. It is said that Sir George Brown declined the honour of being a knight; perhaps he is waiting for a Baronetcy, and perhaps he thought it would be hardly consistent with his professed Radical views. However that may be, one thing is certain—that Sir Charles Tupper and Sir Samuel Tilley deserve the title. The reception at Montreal on May 24 was all that could be wished, and the people of this country, both at Montreal and Kingston, have shown that they can appreciate the blessing of living under Queen Victoria. As I write the reception and rejoicings are going forward in Quebec, whence Her Royal Highness has gone. Last night the Duke of Argyll passed Toronto, having come from Nicaragua Falls by special train, on his way to Montreal. But my readers by this time must imagine I have struck a vein of royalty and aristocracy and knighthood, and probably would like to know something of mines calculated to produce more material wealth.

The SNOWDEN MINE has been steadily progressing—that is, as steadily and slowly as all mining is done in Canada. In the first place Mr. Miles got a lease of a great portion of the mine; then he commenced to build a railway for four miles to connect with the Victoria Railway at Kinmouth; then he bought the right of way as well as he could, but he came across a landholder who wanted too much money; then he appealed to the Legislature, and got a charter. After having obtained the charter he found out that under the law he would not have a private railroad at all, but would be obliged to take other ore at railway rates. This is perfectly just—for if the Legislature gives a charter for the purpose of making a man sell his land at a reasonable rate on account of the public good then it it a public railway, and governed by the same laws as any other railway. Now he has abandoned his charter I hear, and intends to build a tram railway. However, it is a very rich iron mine, and if it is properly worked I see no reason why we should not make steel rails out of our own iron. We have plenty of iron, we have plenty of labour, and we can import from Yorkshire or Lancashire the skilled labour cheaper in the long run than we can send the iron ore away and get steel rails. We may as well use our own iron. By the building up of iron industries in Canada and the importation of labour we should decrease the competition for employment in the working classes in England, and thus be a benefit not only to Canada, but also to England. To be sure, there will be lots of selfish people in England who wish to keep the working class at the lowest possible wage, and who only see through a glass darkly what they consider their individual interest; but so it was at the time of the Corn Laws, and yet the abrogation of the Corn Laws was a great blessing to all. However, there are many men of understanding who advocate (according to what I read in the papers) emigration even on a large scale. Some go so far as to say it is the only hope for England.

With regard to the Snowden Mine, however, there is no doubt of its intrinsic value, and as soon as the holders of the other portion of the mine and Mr. Miles come to an agreement the railway will be carried through, and the work will commence.

There have been reports lately from MADOC as to the gold discoveries, but nothing of any great moment.

This morning (June 16) as we arrived into town all the Bulletin boards were full of the Hanlan victory. Rowed at 11·45 A.M. we heard of it in Toronto before 9 A.M. What is the matter with Old England? Can Canada take the championship of both the United States and the "tight little isle?' England will have to be spry—she is losing her trade by her "Free Trade" notions; she has lost the championship in the big sculling match; she is engaged in a foolish war with a race of savages at Zuzuland, and, if she takes it, it will cost her at least 10*l.* an acre and almost a life, according to some of the English papers. We hear on every side the expression—"What is the matter with England?' The shipbuilding on the Clyde has decreased, and the *Mining Journal* has had no hopeful report of metals for a long time.

It is evident that some great work must be undertaken to give employment and resuscitate the trade, and Great Britain has no nobler field than in the building of the Canada Pacific Railway. To-day's Mail has an advertisement—800 men wanted at Thunder Bay. This is a good beginning.—*Toronto, June* 10. BOURNONITE.

OCHRE.

SIR,—"Enquirer" in last week's Journal is referred to Hull as an important colour centre, and Messrs. Blundell, Spence, and Co., Beverley-road and Bankside, are suggested as a typical house. Let him try a London colour (drysaltery, I presume) broker. Taking London, then, Sir W. A. Rose and Co., Upper Thames-street, and Brandram Brothers, Philpot-lane. These may suffice for his purpose in breaking ground. There are many other names, all of which can be found in Kelly and Co.'s Building Trades Directory.

WEEKLY READER.

WINDMILLS FOR MINING PURPOSES.

SIR,—It has afforded me much pleasure whilst perusing your valuable Journal to see the various improvements made of late, also the many suggestions given for the cheap working of our mines, as well the dressing of the ores, and the description given last week of Hall's combined stone-breaker and crushing-rolls seems like another step in the right direction, and if this be driven by a windmill, and if it can be fixed cheaply, and also easy of removal, it would be of great importance to many mines, as cheap power and machinery, in conjunction with the very low price of labour, is at present the all-important desideratum; and as it has been shown that windmills can be used to great advantage for many mining purposes, perhaps some of your numerous correspondents can state the prices for which suitable windmills can be fixed to drive the size crushing machines named, and I do not see why that windmills should not be brought into much more general use for mining purposes at no very distant date. And if makers would turn their attention to producing a good machine at a low price, and publish in the Journal, I have no doubt but they will be largely patronised.—*July* 2. MINER.

IS IT RIGHT TO PAY ANY PURCHASE-MONEY FOR MINES?

SIR,—I have noted Mr. Salmon's letter in the Supplement of your valuable Journal of June 14, and wish to say that he is mistaken in assuming that I have not carefully read his letter, for I have done so several times, with a view to discover if I misunderstood him, but I am of the same opinion with regard to him now as heretofore. Mr. Salmon has done nothing more than give a statement of his opinions, which are not supported by anything he has advanced, and which would render it proper to be guided by him in the matter of value. He simply entertains the idea that it is "right to pay purchase-money for mines," without being able to give any reason why, and there we have an end of him. He has shown no evidence whatever of ability to treat this great question in a theoretical and practical manner, and he has left the world just as much in the dark as it was before he entered the lists as champion upon the subject—Is it right to pay any purchase-money for mines? It would appear that he is wonderfully desirous to be considered the chief leader in the discussion, and, so far as he is *sain*, I go with him, but no further.

It has become a maxim that when persons get into an elaborate discussion upon a subject they do not thoroughly understand they become evasive, and do not think that this, that, or other points raised bear upon the subject, and "decline" to take it up, and this is the spirit Mr. Salmon has shown when from fear he declined to answer the fair and proper questions put to him by Mr. Hoskold. Mr. Salmon has appointed himself leader on the positive side of this question, and it was only right that he should have been prepared to answer questions any gentleman thought proper to put to him as bearing upon the subject. This would have been the way to sift the matter to the bottom. In your Supplement of June 14 Mr. Salmon says, "My contention was that it is right to pay a purchase-money for mines if the value justified a purchaser in doing so as a commercial transaction." In this quotation Mr. Salmon has once more totally involved himself, in fact in it we have Salmon *v.* Salmon. The sense of the words used by him, and quoted above, is that purchase-money is to be paid "if the value justified a purchaser in doing so as a commercial transaction." Oui, oui, Monsieur, certainement, that is true as far as it goes, but then the words Mr. Salmon has used convey other ideas, one of which is that the value is capable of being defined beforehand, for if it were not so how is it possible that a purchaser could know that the value justified him in paying purchase-money; and how can it be a commercial transaction unless the thing bought is worth the money paid? which implies, as a matter of course, that all the elements involved in the transaction are open and determined. Is the value to be settled by Mr. Salmon when consulted, on the spur of the moment, by a mere thought or sudden effort of the will, and according to the unsettled and unscientific notions he entertains? or is it to be determined in a special manner by science and skilled mining practice, and which of the two is most rational and to be depended on? I assume that Mr. Salmon will urge that he only refers to an open mine where the value is apparent upon the profit which is really realised, but if that is his notion it is a very contracted one, because a system of value is capable of being applied to an unopened mine as well. In fact the science of value is universal, as has been forcibly stated by the authority on the valuation of mines I had the honour to refer to in my first letter.

Mr. Salmon has not given many figures in any of his letters as illustrating his idea of value, but the few he favoured us with were enough to lead us to conclude that the practical as well as the scientific part of the question of value is totally beyond his comprehension. I need only refer to Mr. Salmon's letter in the *Mining Journal* of April 26 in order to prove this. In that letter he states words as follows: "The omission I made was as to the remaining 250,000*l.*, which, taking round numbers, I put down as the purchase, which should, of course, be recouped in the five years, in addition to the dividend of 50,000*l.* per annum for that period." This is a clear statement, from which he cannot retire, and although the fallacy in it had been previously pointed out by Mr. Hoskold, Mr. Salmon thought proper to be silent as to it. I suppose he "declined" that too. Instead of declining, why did he not give full particulars as to the reason why he put down 250,000*l.* as the purchase-money? I suppose he jumped at it.

Mr. Salmon cannot possibly understand the true principles of value when he states so positively that the dividend or yearly income of 50,000*l.* should be recouped, as well as the purchase-money of 250,000*l.* Such a statement as this is worse than absurd, and as fatal to any opinions Mr. Salmon may entertain upon the question of laying down a scientific basis of value as anything well could be. Mr. Salmon has some vague idea about recoupment, but he fails to set out the mode of recoupment to be made, and also what sum of money was required to be set aside for that purpose. A very common notion exists in these times, and that is that those who do not understand a matter themselves are the first to express opinions as to the impossibility of the same matter being understood, determined, and applied by others. In this position do we find Mr. Salmon, for he says in his letter in your Journal of June 14—"As I am decidedly of opinion that no general principle of value could be laid down which would enable an intending purchaser to decide what he should give in any particular case, as the value of every mine will be dependent on its own special features." The particular sense of Mr. Salmon's words just quoted must be taken in connection with that he has stated in the former part of his letter (and like his recouping the dividend of 50,000*l.* with the purchase-money of 250,000*l.*) for what it is worth, and that in my view is very little.

There is a strange contradiction in terms all through Mr. Salmon's letters, which he and his friends should much regret. There are not two questions to be mixed, as Mr. Salmon would have it. The real question is—Is it or is it not right to pay any purchase-money for mines, but there are many points involved in that question which cannot, as Mr. Hoskold has stated, possibly be determined by one party saying yes or another party saying no. There is mining engineering and geological knowledge to be brought to bear on the one hand, as well as the theoretical portion, which includes a very great amount of mathematical knowledge on the other hand, involving the working out and the practical application of particular and intricate financial problems which introduce the complications of compound interest. These things, with others, go to make up an expert in valuing. Can Mr. Salmon or Mr. Erwen pretend to either one or the other of them, to say nothing about the whole? If they can, we should have had an exhibition of it long since, but if they cannot their silence would be far more welcome to the public than columns of letters containing repeated assertions without proof. Is it possible for Mr. Salmon to be so far ignorant of the practice of his countrymen as to be able to do nothing else than continually assert that it is right to pay a purchase-money for mines, and deny the possibility of determining the amount? If so, then great pity is due to him. The practice of the mining world has been such as to settle the question long before Mr. Salmon thought proper to enter upon it, but of this he appears to be but very ill informed. As to one of the points in the question brought forward by Mr. Hoskold, as regards the determination of the contents of a mine, the cost of installation, probable profit, and other matters to be settled before a valuation can be made, no properly trained practical mining engineer of standing can see such a difficulty in that as Mr. Salmon and those aliases of his would desire the public to believe.

These are some of the vital points in the question for mining, engineering, geological, and financial experts to determine. It is only natural that intended purchasers of mines should consult those who are in the habit of devoting themselves to valuation as a speciality. But, as I said in my first letter, good specialists on the subject are exceedingly few, and although there are many practitioners in the older mining counties, nevertheless, strange to say, I have heard of but one authority on this great and important matter. I lightly referred to this fact in my former letter, and it appears that it remained for a Frenchman to inform Mr. Salmon what has been done by one of his own countrymen, I presume.

Is it possible that I am better acquainted with the scientific literature produced in England than Mr. Salmon is? I received Mr. Salmon's courtesy with all respect, but I cannot set aside the main question with a view of using nothing but laudatory terms to others. Thanks are due to Mr. Salmon for fighting on the side of what is right, but evidently he mistook his strength, and I do not think he has won any glory by the way in which he has conducted it. I cannot help believing Mr. Salmon, Mr. Johnson, "F.G.S.,"* and Mr. Erwen are not four, but only one person.

Mr. Salmon has been obliged to confess that he represented three persons out of this batch, consequently there is good reason for concluding that he embraces the fourth name also. What nonsense have we here when we find a gentleman stating that he did not know whether he signed his own name to his letter or the name of someone else, and why did he leave a correction to be made by the editor, who could know nothing about it. A. LEON, Ingénieur.

Rue Delambre, Paris, July 1.

THE COPPER MARKET, AND ITS PROSPECTS.

SIR,—Knowing that the copper market and its prospects always afford interest to the readers of the *Mining Journal*, I enclose a few remarks upon the subject. If the expression of my views should be of no other value it may at least invite fair discussion, and conduce to a proper ventilation of the subject. Anything that may lead to an amelioration of the present truly deplorable state of the copper industry will be hailed as a national benefaction.

The statistical circulars of Messrs. Richardson, of Swansea; Messrs. Pope and Brothers, of New York; Messrs. Sparrow, of Liverpool, and some others have afforded me valuable information hereon, and while recognising the sources of my information, I must exonerate these firms from any responsibility for my inferences, while I am alone responsible for any erroneous conclusions at which I may arrive in reviewing the subject. To premise I may mention that the annual consumption is about 120,000 tons, made up by contributions (taking the last year 1878) somewhere about as follows:—

Chili	Tons	48,000
Produced from pyrites		21,000
Spanish precipitate		4,000
Australia		9,000
America (about)		15,000
Germany (Mansfield)		6,000
United Kingdom		4,000
Cape of Good Hope, British North America, and all other sources		13,000
Making a total of about		120,000

Let us now look at some of these sources of supply, and see how far they are likely to maintain their usual quantities, in face of the continued depression in prices. The largest producer is Chili, and the imports in copper and its equivalent in regulus, &c., for the last six years has been 43,231, 49,372, 48,839, 49,089, 44,472, and 46,973 tons respectively, giving 281,776 tons, or an average of 43,629 tons per annum; but the last year's import embraced the whole of the accumulated stock of the Edwards' family, some 14,000 tons, only a small portion of which may be reckoned as the produce of 1878. Indeed, 40,000 tons is put down as the maximum production of Chili in 1878, while in 1879 a still further decrease is pretty confidently expected, 36,000 tons being looked upon as the maximum.

The next on the list is, however, the most important factor in the account; the supply from cupreous pyrites from the Rio Tinto, Tharsis, and other mines has been very large, and greatly disturbed the market. As long as the by-products were saleable at remunerative prices there was practically no limit to the copper that could be produced from this source, though the copper yielded was only 2 per cent. But while the gold, silver, cobalt, copper, sulphur, &c., could be extracted from millions of tons with a small profit, and while all these found a ready market, it was found difficult to dispose of hundreds of thousands of tons of sulphur, or millions of tons of sulphuric acid; in fact, the keystone of the whole fabric gave way, and a large decline from this source of supply is inevitable. The price of copper is only a very small element in the success of this branch of industry; but seeing that every ton of pyrites contains about ½ ton of sulphur, the market for the last-named by-product is all important. Even the iron produced in the operation, and used for "fettling" furnaces, is no longer worth the cost of extraction. As a consequence we find that the trade, which in a few years attained collossal proportions, is now exhibiting signs of rapid decadence. In 1877 there was produced from this source 24,800 tons of copper, or over one-fifth of the entire production of the world, in 1878 only 21,000 tons were produced, and in 1879 the produce is not expected to exceed 16,000 tons—a positive reduction in one year of 3800 tons, and a further expected decrease of 5000 tons.

From any other source no great diminution of the output is anticipated, seeing that most of the old English and Australian mines are shut up, without much prospect of reopening until there is a considerable and permanent rise in price. From these two sources alone we may, therefore, confidently look for a decrease in supplies of 10,000 to 15,000 tons in 1879. In the elaborately compiled statistics of Messrs. Richardson we find that the average imports and exports for the first ten months of 1876, 1877, and 1878 were as follows:—

		Imports.		Exports.
1876	Tons	65,191	.....	42,778
1877		77,701	.....	41,461
1878		74,431	.....	47,302

A comparison of the figures of 1877 and 1878 shows that while the imports in the first ten months of 1878 were 3300 tons less than for the corresponding period of 1877; the exports in the same period were 6000 tons more, showing a total of over 9000 tons in favour of the market. But notwithstanding these facts the quantities afloat and in stock in Liverpool, London, and Havre on Dec. 1 were 46,539 tons against 32,287 tons at a corresponding period in 1877. Still on Dec. 31, 1878, the stock was 1360 tons less than at a corresponding period in 1877.

Reviewing the ruling prices for some years past, as shown by the circular of Mr. Wm. Simpson, of Glasgow, we find that from 1830 to 1869 copper averaged 93*l.*; from 1840 to 1849, 89*l.*; from 1850 to 1859, 109*l.*; from 1860 to 1869, 89*l.*; in 1870, 70*l.*; in 1871, 74*l.*; in 1872, 96*l.*; in 1873, 92*l.*; in 1874, 86*l.*; in 1875, 88*l.*; in 1876, 82*l.*; in 1877, 75*l.*; and in 1878 it fell to 67*l.* The highest price attained during this period was in 1872, when tough cake reached 115*l.*, or nearly double the present market price. During these years it is apparent that copper has averaged over 90*l.*, without over production; hence, but for the disturbance caused by the supplies derived from cupreous pyrites, the market would probably have maintained somewhere about the average price. But another and more important inference is that the supplies cannot be maintained at a price much under that which it has averaged during the last 50 years; otherwise we should have had excessive supplies during that period. Messrs. Pope and Brothers, of New York, have pointed out that copper is selling at 20*l.* per ton under its normal price—that is, the price at which it can be produced, and that the consumption being about 120,000 tons per annum it follows that copper producers are losing an aggregate of about two and a half millions sterling per annum—a most significant fact in connection with the future price. At no very distant date we shall see copper go up with a bound, the price ultimately settling down somewhere between 70*l.* and 75*l.*, that being the lowest price at which the world's requirements can be obtained from existing known sources of supply.

I may also take the opportunity of enclosing you some information about a discovery of native copper. From New Zealand I have just received some masses of serpentine rock, thickly impregnated with native copper. It comes from Nelson, and was forwarded by

* We have already stated that the printing of Mr. Salmon's name "Johnson" was entirely due to the carelessness of the compositor and reader. In the *Mining Journal* of June 14 Mr. Salmon distinctly claimed the authorship of the letters signed "Wm. Johnson," and "F.G.S."—ED. *M. J.*

a well-known expert, Mr. T. R. Hacket. The rock is said to exist in abundance, and to cover some acres of ground. A specimen of this remarkable rock I have sent to the Mining Department, and shall be happy to send you one. The material contains about 5 or 6 per cent. of native copper, and existing in such abundance as described by Mr. Hacket would if suitably treated pay handsomely. In this country I have never met with copper existing in the same form in serpentine rock, but it exists in a porphyritic rock, as native copper and suboxide, at a place not far from Parkes. Believing it to be a new contribution to the mineralogy of the colonies I send you these details. S. L. BENSUSAN.

Kangaroo Tin Smelting Works, Sydney, May 10.

STAGNATION IN MINING.

SIR,—As a reader of your valuable Journal, I am wishful to raise a warning voice to the faint-hearted who are dismayed at the present low price of minerals, and who are inclined to relinquish valuable properties or interests in the same from the fact that they will not, at the present price of ores, give them profits as in years gone by when better times prevailed. As matters now stand in respect of minning I have no doubt some really good prospective mines will be abandoned, and there are many not slow to take advantage of such a crisis and possess themselves of properties already laid open, with plant, machinery, and all the requirements for successful development. It is a bad wind that does not blow good to some one; and the low price of minerals will doubtless bring fortunes to many in the way I have just remarked, while the chicken-hearted will allow their fortunes to pass into other hands, and repent when a reaction occurs in mining and business matter generally. That a reaction will come, and perhaps sooner than even sanguine people imagine, is certain. Who that has had experience can deny this? And that fluctuations are as sure to come as that trade and commerce has an existence. A MINER.

Durham, July 2.

PRACTICAL MINING.

WATER-WHEELS, WIND-MILLS, AND OTHER WIND INSTRUMENTS V. STEAM.

SIR,—The letter of Capt. John Roberts, published in the Supplement to the Journal of June 21, escaped my observation until the pointed remarks of your North Wales Correspondent in last Saturday's Journal drew my attention to it. Of late we have heard and read a great deal concerning cheap motive power for the development of mines, and amongst others advocating the cheap system Capt. John Roberts has from time to time assumed a prominent position. Some time since water-wheels appeared to be his hobby, and with their aid it was unqualifiedly asserted that the D'Eresby Mountain and other mines with which he was officially connected were going to perform wonders, so plentiful and available was that cheap instrumentality. May I ask what has become of it. Has he ridden that hobby to death or to the confines of dissolution, and finding it inoperative and ineffectual abandoned it for another, which I have no hesitation in pronouncing an equally capricious and unreliable steed. I infer from his having introduced the wind-mill hobby that the other did not meet the expectations which were entertained of it.

It has been repeatedly affirmed of the D'Eresby Mountain Mine that its resources were almost inexhaustible, and that the economy of its working by adit drainage to a considerable depth, with its water power for crushing and dressing the ores, were advantages unequalled in this and most other districts. It is not my intention to dispute the first and second postulates, as for anything that I personally know to the contrary they may be true to the letter, but my object is to show that the efficient working of the mine, notwithstanding its favourable natural advantages, requires a motive power greater than they possess or can supply by wind or water to reduce and make marketable the ores in remunerative quantities. Capt. John Roberts assumes that steam power is too expensive to be employed in the working of the mines of this district, and advocates the utilising of wind as an auxiliary to—what I may be pardoned for designating—his water power craze. He evidently implies it would supersede steam. I am at issue with him on this point.

I shall take the official estimates, presuming that the estimates and statements which have appeared from time to time in Messrs. Watson Brothers Circular respecting the resources of the D'Eresby Mountain Mine and the efficiency of its machinery for crushing and dressing the ores are official, as the head of that firm is, as I understand, the managing director of the mine. It was stated by them some time since that the dressing machinery and other arrangements at the mine were of the most modern and approved pattern, capable of reducing and otherwise disposing of from 40 to 50 tons of stuff per day, which at the lowest estimate it was stated would yield 5 per cent. of marketable ore. In treating 40 tons of 5 per cent. stuff per day, and regarding the number of working days as 26, the yield for that period should be 52 tons. Now, if we accept, it as we are justified in doing, that they have failed of this result solely from the insufficiency of their water power for crushing and dressing the ores, and that 30 tons only have been cleaned and made marketable during the eight months which have elapsed since their crusher and jiggers were set at work, there is a deficiency in the output of 391 tons, which from their own statements would, I presume, have been prepared and brought to market if the means of crushing the ore had been commensurate—that is, if steam power had been employed instead of toying with a little rain water. The objection to steam in that quarter is said to be its expense. Now, let us see what that amounts to. The cost of working the crusher by steam power would not exceed 20*l.* per month, which, according to the foregoing estimates, would result in an increase of 48 tons per month to the returns, amounting at 8*l.* per ton to 384*l.* If we deduct from this 20*l.*, the cost of working the crusher, and 100*l.* for additional hands to supply the crusher and dress the ore, a balance of 264*l.* will appear in favour.

It was stated in the *Mining Journal* a week or two since that the working cost of the mine was only 160*l.* per month. If we may regard this as the average of the eight months which have elapsed since the crusher and jiggers were set to work, the labour cost has amounted to 1280*l.* If 30 tons of lead ore have been prepared, which I think is doubtful, of the value of 8*l.* per ton, there are just 240*l.* to set against the costs, 1280*l.*, showing a deficiency of 1040*l.* By this so-called cheap method the cost per ton of getting the ore is upwards of 42*l.* On the other side, by adding 120*l.* as the increase of expenditure requisite to supply a steam crusher and dress the ores to the 160*l.* now incurred as working expenses, there would be a monthly cost of 280*l.* to deduct from the proceeds of 52 tons of ore at 8*l.* = 416*l.*, showing a margin of profit of 136*l.* per month, whilst the cost per ton of getting the ore would not exceed 5*l.* 7*s.* 8*d.* The difference in the two methods is shortly this. By the so-called cheap method a loss appears of 1040*l.*, but by the more vigorous method a profit of 1088*l.* would accrue, making together a difference in favour of steam of 2128*l.* = 266*l.* per month for the period referred to.

What will Capt. John Roberts say to this? Will he attempt to dispute my line of argument, or will he cavil at the premises? The former would be futile; the latter humiliating, seeing I have reasoned throughout from official statements furnished by himself and his principal. But if the mine is not equal to the returning of 40 tons per day of 5 per cent. orestuff, or the machinery to the treatment of that quantity, the result, of course, would be different; but with that I have nothing to do. I have dealt with the official statements I have seen published for general information, and the result I have arrived at is the inevitable sequence of their rational investigation.

I have merely to state further, lest I should appear to undervalue water as a motive power, or wind where it can be effectually utilised, that water where abounding in sufficient quantity is a valuable source of power, but when it is scarce and intermittent it is the reverse of power; it is a source of weakness, an obstruction to progress, a delusion and a snare, and such it has been to mining in this district as well as in many other parts of Wales, and will continue to be as long as it is regarded as the *primum mabile* instead of as an auxiliary or accessory power. Wind also may be subservient of some useful purpose, and those who think so much of it in its application to mining would best show their faith in its value by adopting it. Capt. Roberts, for instance, at D'Eresby Consols; he has sufficient elevation there to come in for a full share of all the wind that blows in the district. There is no teaching so forcible and impressive as that by example. ROBERT KNAPP.

Llanrwst Lead Mine, July 2.

THE LLANRWST DISTRICT.

SIR,—You will doubtless permit me to call the attention of your North Wales Correspondent to the injustice he has done me in his report of last week. At first I was utterly at a loss as to what could have induced him to express himself concerning me in the way he did. I was quite certain that there was nothing of a personal character in my letter published in the Supplement to the Journal of June 21; but on referring to that Supplement for the purpose of ascertaining what it could possibly have arisen from, I was not long in coming to the conclusion that he had taken it for granted I was the author of the letter headed "The Llanrwst District." I do not know what internal evidence that letter contains to convict me of being its author, nor do I know what—if any other—reason your correspondent may have had to charge it to my account. I have only to say I did not write the letter, nor do I know who did, but presume it was someone having a greater interest in the D'Eresby Mountain Mine and Company than I have. ROBERT KNAPP.

Llanrwst Lead Mine, July 2.

MINING IN THE LLANARMON DISTRICT.

SIR,—I observe, with much satisfaction, that special notice has been called to this portion of the lead-bearing district; and from the recent valuable discovery at the Bodidris Mine, on the Maes-y-Pwll vein, which is altogether in virgin ground to the east, where the true bearing portion of the country lies, I have no doubt the most energetic and active mining pursuits will speedily follow, notwithstanding the deplorable stagnation which for various reasons has so long paralysed the spirit of mining enterprise—indeed, it is remarkable that already great activity prevails here, and properties of unmistakeable promise are being steadily developed and brought under notice. The Lady Ann Mine, now worked in private hands, seems destined soon to make its mark, as the property embraces an entirely unworked portion of the exceedingly rich old Westminster Mines, to which its boundary adjoins westward, whilst rich bodies of ore have been worked on the same lodes further on in the same direction up to the boundary on the further side (west), so that in point of fact there are upwards of 400 yards in length of unworked ground on the best known lodes in the district, with already proved riches on each extremity (east and west) of their line of direction. A new bearing lode, in addition to these, has just been discovered on the junction of a cross lode, bearing ore from near the surface to the present depth (12 yards), and both of these lodes will form a junction with the Westminster lode, in all probability, in less than 30 yards from surface. At this junction of the several lodes it is confidently expected a good course of ore will be discovered, the ground being speedy, and set at 55*s.* per fathom. The Lead Era is another undeveloped property in the flat measures of much promise, having several main lodes known to exist in the limestone underneath, and it is particularly worthy of note that in this new property the ground is so speedy, free from water charges, &c., that the most effectual development can be made with a comparatively trifling outlay. The appearances of the flats where exposed are at present of the most encouraging nature. The Pant Du Park, also to the west of Bodidris, on the same lodes, shows good signs of life in ore just found on the same lode as the Bodidris discovery, recently developed. Then, again, a new piece of country to the south of Bodidris, in which several main veins are found, has been undertaken by an influential and spirited company, now called the Llandegla Mine Company, and it is scarcely doubtful, seeing the energetic and scientific manner in which these new properties are being opened out, that a successful future awaits their development.

MINING ENGINEER.

THE SCIENCE OF INVESTMENT.

SIR,—The science of investment to be of any practical use must be searching in its character and application, in respect either of the merits in possession or prospective, of all undertakings and enterprises of a speculative nature under consideration. These should be thoroughly investigated and their true value established, otherwise the principles of true finance and profitable use of capital become wholly neglected.

In the autumn of 1869 we made the subjoined observations and summary of the position, present and prospective, of the Devon Great Consols, an l time, the leveller of all criticisms, has established the correctness of our predictions. It would prove valuable to the public if even one of your various correspondents would favour your readers through the columns of your valuable Journal with the inherent worth, at present and prospectively, of this celebrated mine, based on the existing rate of wages and prices of fuel and materials, contra ruling prices of metals and minerals, as, while free trade exists it is useless to expect any advance in prices of copper or arsenic, and it is also beyond consideration that the Legislature will adopt protective measures to advance the interests of the south west peninsula in opposition to that of the manufacture and trade of the whole mass of her Majesty's subjects resident throughout the whole districts of Great Britain and Ireland. The same argument applies to Carn Brea, Tincroft, Wheal Owles, and West Chiverton, for the outlook of both tin and lead is anything but encouraging.

Extracted from the "Science of Investment," published by the writer at the close of the year 1869:—

"The Devon Great Consols has unquestionably proved one of the most startling and brilliant prizes of the present century, and beyond any contemporary copper mine has excited the attention of the general public. This company is now, however, of more interest, and more worthy the attention of the pupil of the 'Science of Investment' that at any former period of its career. The Devon Great Consols stands boldly forward as an example of unparalleled success. In the year 1845 the ores were first discovered at Wheal Maria, and so rapid were the discoveries that in 1846 copper ores of the value of 116,068*l.* were realised from 13,292 tons of produce, affording dividends to the extent of 72,704*l.*, and this result was established upon a subscribed capital of 1024*l.* only, whilst the commercial value of the property attained the sum of one million sterling. This extraordinary career, however, received a very serious check during the ensuing two years, the dividends having fallen to 25,600*l.* and 15,204*l.* respectively. The mines about this period were reported by various authorities to be rapidly exhausting, and the market value fell from 1000*l.* to 180*l.*, 200*l.* per share. A favourable change, however, soon altered the prospective aspect of affairs, for in the year 1849 the gains were doubled. It must be borne in mind, however, that the large tract of ground belonging to the company was at that time almost wholly unwrought, but at this period the works extend for miles in length, and comparatively the concession belonging to the company is proven, and the chances of further discoveries lessened in proportion to the extent of virgin ground wrought. From 1849 to 1854 dividends increased to 64,512*l.* for the latter year, and during the next 12 years the enormous sum of 656,384*l.* was distributed, equal to 54,698*l.* 13*s.* 4*d.* annually up to 1865*l.* For the last three years they were respectively 40,960*l.*, 40,960*l.*, and 36,846*l.*, making a grand total of 1,150,976*l.* in 25 years—say, 4500 per cent. annually, the greatest percentage we remember to have accrued in the annals of mining enterprise."

The second portion of the Devon Great Consols is as follows:—

"The market value has gradually and continuously declined from 450*l.*, 460*l.* to 150*l.* per share, and will probably still further retrograde. To apply the 'Science of Investment' to this case we must investigate its true position, both in possession and prospectively, and we will endeavour to realise the twofold objects in the following summary. The annual statement of affairs and reports are now before us for the last two years. In May, 1868, at Wheal Maria, the reserves were 300 tons; in May, 1869, 150 tons. At Wheal Fanny they were reduced from 1287 tons to 1030 tons; at Wheal Josiah from 36,093 to 19,767 tons; at Wheal Emma from 19,379 to 17,290 tons; whilst at Anna Maria they had increased from 5790 to 7812 tons. The results show that the reserves were reduced during the year from 64,620 to 44,284 tons, or 20,336 tons during the 12 months, and in money value about 90,000*l.*, to produce dividends of 36,846*l.*, which evidently came not from discoveries of ore, but sheer exhaustion and reduction of cash in reserve."

It is for the general interests of mining that we reproduce the above extract from our work published in 1869, and it would prove most pertinent and instructive to the general public to become enlightened upon the respective merits of recently established comparatively shallow companies, such as Wheal Peevor, South Condurrow, Wheal Eliza, Bwlch, Cwm Brwyno, South Darren, and two or three lead mines in the locality of Mold, with Capt. James' prize in Lelant, in juxtaposition of the old and partially paralysed companies, as, for instance, South Caradon, Botallock, Owles, Lisburne, Phœnix, and others of similar calibre and past repute. It is important to state that mines often pay dividends after pioneer points cease to augment reserves. However, holders in established mines should realise whenever returns exceed discoveries.

R. TREDINNICK,
Dealer in Stocks and Shares, Mineowner,
38, *Cornhill, London, July* 1. and Consulting Mining Engineer.

Meetings of Public Companies.

WHEAL PEEVOR MINING COMPANY.

A four-monthly meeting of the adventurers in this mine was held on Tuesday,—Mr. THOMAS PRYOR (the purser) in the chair.

The accounts showed that the labour costs were 2995*l.*; merchants' bills to the end of June, 1565*l.*; rates and taxes, 45*l.*; dues, 321*l.*: making a total expenditure of 4928*l.* The receipts were 6633*l.* for about 187 tons of tin, showing a profit on the sixteen weeks' working of 1705*l.*, and a balance in favour of the mine of 2199*l.*

The CHAIRMAN stated that the accounts were charged up to the end of June, and included every known liability up to that period. Last year they sold about 452 tons of tin, which cost to return 27*l.* 15*s.* a ton, and was sold at an average of 34*l.* 5*s.* a ton, giving a profit of 6*l.* 10*s.* a ton. At the last meeting they sold 183 tons, which cost 26*l.* 11*s.* 9*d.* per ton to raise, and was sold at an average of 33*l.* 12*s.* 6*d.*, or a profit of about 7*l.* 0*s.* 9*d.* per ton. In the present account they had sold 187½ tons, which had cost 26*l.* 6*s.* to raise, and had been sold at an average of 36*l.*, giving them a clear profit of 10*l.* per ton. At the last meeting he told them that every 1*l.* per ton they got for their tin would be an additional profit to them, and the above figures proved that what he then said was correct, as the cost of returning their tin was about the same, and what they had got beyond that was all profit. At the last account their profit on about the same quantity as now sold was 1205*l.*, and the tin was sold at an average of 33*l.* 12*s.* 6*d.*, while at this account they had sold at an average of 36*l.*, and their profit was 1705*l.*, and this was why they were enabled to give an increased dividend that day of 2*s.* 6*d.* per share, and to carry forward a credit balance of about 700*l.* (Hear, hear.) While the mines of Cornwall were able to return tin at 26*l.* per ton, he thought they need have no fear of Australia or any other tin producing country. (Applause.)

Capts. W. T. WHITE and JOSEPH PRYOR in their report say—"At the time of our last meeting the new balance-bob at the 36 was in course of erection. This work has been accomplished now for several weeks, and at once preparations were made for the sinking of the engine-shaft below the 80, which is now being carried on with all speed by a full pare of twelve men. The shaft being about 7 fms. to the south of the lode we shall not ascertain its value until we reach the 90, but judging from the productiveness of the lode in the 80 we have not the slightest doubt about the result when we reach the 90. The lode in the 80, driving west of engine-shaft, is the full size of the end, and worth 45*l.* per fathom. The lode in the 70, driving west, is worth 14*l.* per fathom. The lode in the 60, driving west, is worth 20*l.* per fathom. The lode in the 48, driving west, is worth 15*l.* per fathom. The lode in the 36, driving west, is worth 40*l.* per fathom. The lode in the 36, driving east of main rise, is worth 9*l.* per fathom. The lode in the 36, driving west of No. 1 cross-cut, is worth 8*l.* per fathom. The lode in the 36, driving east of No. 1 cross-cut, has been disordered by a slide, but is now getting through it. The lode in the 26, driving west, is worth 15*l.* per fathom. The lode in the rise in the back of the 26 (carried 12 ft. long) is worth 10*l.* per fathom. We are now sinking in the bottom adit level, directly over the main rise, in order to effect communication between these points as quickly as possible. This we expect to do in about three months time. The lode in the bottom of the adit level is worth 9*l.* per fathom. We have six stopes working on tutwork, the lode worth in each 11*l.* per fathom. We have also fifteen pitches working on tribute, employing 53 men and boys, at tributes varying from 2*s.* 6*d.* to 11*s.* in 1*l.* We are very pleased to be in a position to report so favourably of the mine, which is looking remarkably well, and we can faithfully promise (all being well) a similar quantity of tin for the coming sixteen weeks as we have had in the past."

Capt. WHITE added that they had 76 men employed on tutwork, in sinking, driving, stoping, &c., and of this number they had only 26 stoping ground, the other 50 being employed in developing the mine. This he thought would compare favourably with any mine in the county. They had driven west upon the south lode at the adit level, and they had now got in over the main rise, and had commenced to sink a winze in the bottom of the adit level upon the rise going up in the back of the 16. In about three months they hoped to communicate those two points, and that would give them excellent ventilation, as well as a good footway for the men. They should then start a rise at the back of the adit and communicate to the surface, and when that was done they would fix a double skip-road in the shaft, in order to discharge their stuff more effectually than they were doing at present. The 80 fm. level, which was the most valuable level they had in the mine, spoke very loudly indeed for the 90, and he believed it would prove even more productive than the 80. That they should have so many levels one over the other, all having a certain value, and giving a breast of ground 60 fms. in height, was, in his opinion, a great and grand thing, and after they had communicated the main rise they would be in a better position than they were at this moment. (Hear, hear.) About a week ago they had an important discovery in West Peevor, and he considered that this discovery very greatly enhanced the value of Wheal Peevor, so that they had reason to congratulate themselves not only on their present position but on their future prospects. (Applause.)

On the motion of Mr. CHELLEW seconded by Mr. WOOLCOCK, the accounts were passed and a dividend of 10*s.* per share was declared.

Mr. CHELLEW then proposed a cordial vote of thanks to the purser and agents for their excellent management of the mine, and this was seconded by Mr. MILFORD COCK, who congratulated the adventurers on the position to which the mine had been brought, as well as on the state of the finances. There were very few mines in the county that brought their accounts up to the very hour of the meeting, and in this respect he thought Wheal Peevor might be regarded as the first mine in the county. (Applause.)

The resolution was carried unanimously, and the CHAIRMAN, in returning thanks, said he had no doubt whatever that what they had done in the last four months they would do again in the next. He was anxious that they should have a reserve fund of not less than 1000*l.*, and seeing that at the next account they would have three months' bills against four months' returns, he had no doubt they would be able to increase their reserve fund to that amount, and to pay the same dividend as they had done that day. (Hear, hear.)

After the meeting the adventurers dined together, when the usual toasts were proposed.

The CHAIRMAN, in proposing "Success to the Mine," said the fact that they were able to raise tin at about 26*l.* per ton spoke more for the mine than anything he could possibly say. The mine had been visited by a good many inspectors from time to time, and he believed they had all gone away delighted with what they had seen. Great credit was due to Capt. White for the manner in which he had managed the mine, having increased the dividends from 5*s.* to 10*s.* per share, and he had no doubt Capt. White would tell them that they could do the same in future. (Hear, hear).

Capt. WHITE said this was the fifth successive dividend that they had paid in the mine, and whether they would be able to increase their dividends in the future depended, of course, on the price of tin. He was glad to say that Wheal Peevor never looked better than at this moment. Since discovering the south lode they had driven six cross-cuts through it, and in every cross-cut, at the point of intersection, the lode had always been productive, and they had gone upon it some 134 fms. in length. They had seen it from the adit to the bottom level, and it was productive for the whole of that height. (Hear, hear). And the important discovery which they had made in West Peevor had proved that the lode not only held beyond the boundary, but into another sett. They could show any day that they had ends 20 or 30 fms. in advance of any stoping ground that they had in the mine, and he need scarcely say that that was a matter of very great importance. They were now employing 270 hands on the mine, and he believed that in about 12 months they would be employing another hundred. He really looked upon West Peevor as one of the best new concerns now before the public; all they had said about Wheal Peevor had proved correct, and he was convinced that what had been said about West Peevor would not be less so. (Applause).

The CHAIRMAN, responding to the toast of his health, said they had recently heard that the stocks of tin for the month of June would show a very large increase, but he was informed that afternoon that there was actually a decrease of 400 tons—(hear, hear)—and this certainly did not look very gloomy. Probably when this was known they would have an increase in the standards. In the working of Wheal Peevor they had had many difficulties to contend with for some years, and they had been obliged to come to the meetings armed to the teeth in order to carry the mine on, but energy and perseverance had surmounted all the difficulties, and the mine had now been brought to a successful issue. At one time it was a sort of life and death struggle with them, but now they could fortunately hold up their heads, and return tin almost as cheap as any mine in the county. (Applause). In conclusion, Mr. Pryor, in complimentary terms, proposed "The health of Mr. Peel," one of the lords of West Peevor, and

Mr. PEEL briefly returned thanks. He was glad to find that Wheal Peevor had done so well, and he hoped, for his own sake as well as for the sake of the adventurers, that West Peevor would do a great deal better.

Mr. F. W. MICHELL proposed "The health of Mr. Edward Heard," remarking that that gentleman had at all times been anxious that mining should be conducted on proper principles, and that open and straightforward statements of accounts should at all times be presented. (Applause).

Mr. HEARD, responding said he had been for nearly 40 years a shareholder in some of the best and worst mines in Cornwall, and it had always struck him that there was only one way—and that was the straightforward way—of keeping mine accounts. (Hear, hear.) He could never understand how it was that deceptive mine accounts had ever been permitted, for crediting tin that was not sold, and leaving several months' costs uncharged, was altogether subversive of good and straightforward mining. (Hear, hear.) If a man lost his money fairly he did not mind it so much, but when he found that he had been deceived he naturally turned his back on those who had deceived him and buttoned up his pockets against any further demands upon him. For some years past they had been going through a period of depression unknown before to the oldest man living; and his own opinion was that they had all been going too fast, and that even the working miners had not been so industrious as they might have been. He condemned the miserable system of cutting down men's wages one month because they happened to have a good sturt the month before—(hear, hear)—and thought there was plenty of room for improvement in that respect.

Mr. F. W. MICHELL, the engineer of the mine, responding to the toast of his health, said Wheal Peevor was not started at a moment's notice, but it was only done after they had satisfied themselves that the property was one which, with

proper working, was likely to turn out a prize. They had two or three setts under their consideration at the time, but they were convinced that Wheal Peevor was the best of them, and accepting the evidence of persons on whose judgement they could rely, they came to the conclusion that in Wheal Peevor they had a very valuable property. That this was so had now been abundantly proved, and his own opinion was that there were other mines in the county quite as good as Peevor if they were only properly worked. He believed also that their chances in West Peevor were quite as good as those in Wheal Peevor; and although the shares of one were quoted at only a quarter part of the value of the other, he really believed that so far as its prospects were concerned West Peevor was quite as good as Wheal Peevor. (Hear, hear.)

One or two other toasts followed, and, in the course of the remarks that were made, Capt. WHITE said he regarded West Peevor as altogether beyond a speculation, and he was very much inclined to the opinion that they would not require any further call for its future development, or if they did that it would probably not exceed 5s. per share.

PENSTRUTHAL CONSOLS TIN AND COPPER MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Cornhill, on Wednesday,

Mr. JAMES LABY in the chair.

Mr. EDWARD ASHMEAD (the secretary) read the notice convening the meeting, which stated that it was called for the purpose of considering and taking the opinion of the shareholders on a proposition lately submitted to them by Mr. H. Waddington, 76, Old Broad-street, of which the following is an outline:—

"The selling for a sum of 3000*l.*, and privileges to the shareholders of our company as mentioned below, that part of the sett known as the "Old Mine," situate to the south of the present company's operations, to Mr. Waddington, or to him and others, his desire being to form a new limited company, for working such mine separately. His scheme is for such new company to have a nominal capital of 20,000*l.*, in shares of 1*l.* each, and to issue 10,000*l.* of such capital within about six months. To give the shareholders in the present company the option of subscribing for two shares in the new company, so that a holder of (say) 25 shares in the present company, by a payment of 5*l.* (and accepting the liability of a possible payment of another 5*l.* subsequently), would become the owners of 25 shares in this company, and 10 shares in the proposed new company. To apply the 10,000*l.*, part of the capital so to be issued, as follows:—Cash to be paid to the present company 3000*l.*, as purchase-money for the south sett, which would be a desirable fund for further vigorously prosecuting the present company's operations, and the remaining 7000*l.* as working capital for the new company, the working of each company to be kept distinct from each other, and the shares in each, and all other matters, dealt with separately, as the businesses of distinct concerns."

The CHAIRMAN said the shareholders would have gathered from the notice read by the secretary the purpose for which the meeting was called. When they met to raise further capital eighteen months ago the directors stated they required 5000*l.*, but the shareholders only came forward to the extent of 2400*l.* So far as his co-directors and himself and one or two of the shareholders were concerned, they took more than their proportion of the debentures, and had all the shareholders assisted them the company would at the present time have been in a very much better position than it was. After paying off the liabilities there only remained about 1300*l.* to carry out the development of the property, and with this small amount the only wonder was that the company had kept on so long. It seemed a great pity that the mine should be lost to the present proprietors for want of funds. They all believed that it was a most valuable mine, otherwise they would not have put so much money into it, but sufficient work must be done to get to a certain depth before its actual value could be ascertained. It would be a very great pity that other people should come in and get the benefit of their labours and outlay. Mr. Waddington's scheme seemed to be a very fair and tangible one if the shareholders would only come forward liberally, and allow it to be carried into effect. By this means the company would be provided with funds for the better development of the property upon which they were now at work to a very small extent. This was the proposition that the directors had to lay before the shareholders, but as Mr. Waddington knew the property well perhaps he might add a few words with regard to it.

Mr. H. WADDINGTON said his impression of the value of the property was such that if the present proprietors gave it up others would certainly try to buy it and get a company to work it. He believed the company was on the eve of a great success if they only spent a few thousand pounds more upon the mine. So far the shareholders had only come forward in support of his scheme to the extent of 1432 shares out of 20,000, but if only 10,000, 12,000, or 15,000 shares were taken up he had no doubt that friends of his on the Stock Exchange would have taken the remainder. By a little outlay, judicious management, and the present low price of material he believed they would have success. The old mine could be forked for 500*l.*, and he believed the rich lode which had been reported upon, but which had not yet been seen, could easily be reached by various cross-cuts from the old mine, and in a very short time they would be able to reach the several other lodes between the old mine and the present workings by means of cross-cuts. A 60 or 70 inch engine would suffice to command the water of both the old and the new mines. He did not know such an instance where there were so many geological features predicting very great success as there were at Penstruthal, and, therefore, he sincerely regretted that the shareholders were so foolish as not to come forward with a few shillings per share to save several pounds. There was a much brighter prospect for tin now than there had been for some time. The Dutch deliveries for the month of June were 825 tons, and there were 1052 tons in London. The arrival of Australian and Straits tin was 779 tons, and the shipments now afloat amounted to 260 tons for last month, the Australian tin afloat being 550 tons, while at this time last year the amount of Australian tin afloat was 2800 tons. He believed they had seen the maximum production of tin from Australia for some time to come, and that they would have an improvement in the price of the metal. The depression had effected such a reduction in the cost, and they had now so much greater facilities for working, that 60*l.* per ton for tin would give them better profits than 90*l.* did in the days of high prices. He would be glad if the directors saw their way to carry out the scheme which he had proposed.

The CHAIRMAN remarked that, as evidenced by the smallness of the meeting, the shareholders took very little interest in their own affairs. The directors had never received any payment for their services, nor did they want any until the company was a success.

Mr. WADDINGTON added that if the scheme were carried out he would put down machinery and plant and not charge them a penny for it, except for labour, if it did not succeed rather than see the thing fall through. He believed there was not such another piece of unproved ground in Cornwall. It was joined by mines from the east, which were doing very well indeed, and they had a parallel junction where the surface had not even been broken.

Mr. GRANVILLE SHARP asked what was the distance between the old mine and the present workings.—Mr. WADDINGTON replied that it was about 100 fms. eastward. They could get a good 60 or 70-inch engine for less than 1000*l.* now, and at Wheal Basset they had only paid 4s. per cwt. for pumps, so that the present was an exceptionally favourable time for such a purchase.

Mr. G. SHARP said he did not think the scheme proposed could be improved upon, if it could be carried out directly. It was certainly the best scheme that had been propounded. It was very much to be regretted the shareholders did not look after their interests better. No doubt many of them lived at a distance, but it was a great pity that a larger number did not strain a point and attend the meetings.

Mr. ASHMEAD said the directors asked for an expression of opinion in writing, but very few of the shareholders responded to the invitation.

Mr. WADDINGTON asked what was the monthly cost at the present time?

Mr. ASHMEAD said it was very limited at present, as many of the points of operation were not being worked.

Mr. WALTON added that they had spent 1387*l.* beyond returns in the 17 months, during which time the ore sold had realised 2467*l.*, and there were sundry receipts amounting to 42*l.*, making together 3951*l.* The amount received for debenture stock was 2336*l.*, out of which they had paid 949*l.* for the liabilities, leaving 1387*l.*, or with the amount received for the sales of ores, &c., 3951*l.*, out of which they had spent 3650*l.* on the mine. The dues amount to 50*l.*, and the total expenses away from the mine for 17 months was about 200*l.* Certainly greater economy could not be practised by the directors and all concerned.

Mr. ASHMEAD, in reply to Mr. G. SHARP, said the liabilities were very small—about 350*l.* to merchants, and a few other things, including a claim of 160*l.* for land damaged.

The CHAIRMAN, in reply to a shareholder, said the amount of the debenture debt was 2400*l.* The directors and Mr. Sturge had come forward and taken more than their proportion of debentures; and, in reply to a further question, he (the Chairman) said under the Articles of Association the directors had power to sell the property without calling the shareholders together.

Mr. G. SHARP, speaking with reference to the reduction which has taken place in the cost of working mines, gave the instance of a mine that 2½ years ago cost 500*l.* per month to produce a return of 10 tons of tin a month, the monthly costs of which had been reduced to 300*l.*, while at the same time the returns of ore had been increased 50 per cent. This was in the same quality of ore ground. No doubt men were doing more work for their money than they did a few years ago, when they were masters instead of men.

Mr. WADDINGTON, in the course of some further conversation, said if it should be decided to reconstruct the company he would do all he could to assist it provided the existing shareholders did their part.

It was then decided unanimously that the scheme proposed by Mr. Waddington should be carried into effect if possible.

Major WALKER said he believed the company had now the services of thoroughly honest, practical, and economical men. He had visited the mine three times, and had spent a week upon it at one time. He had also been to Truro on the business of the company, and he believed they were now getting better and cheaper materials than they ever had before.

The CHAIRMAN said Major Walker was desirous of resigning his seat at the board, as he resided at Colchester, and was unable to attend the board meetings regularly except at great inconvenience, but he trusted that Major Walker would not persist in resigning until the company was settled one way or another.

Mr. J. J. WINSER (the solicitor) also expressed a hope that Major Walker would in the interests of the company remain at the board until Mr. Waddington's scheme was carried, or the company was reconstructed. It was desirous that Mr. Waddington should join the board, but that gentleman could not be buyer and seller at the same time.

Major WALKER said he was also desirous that Mr. Waddington should be a director, for he believed he would be able to render valuable services to the company. He would not promise to alter his decision, but he would talk the matter over with the Chairman.

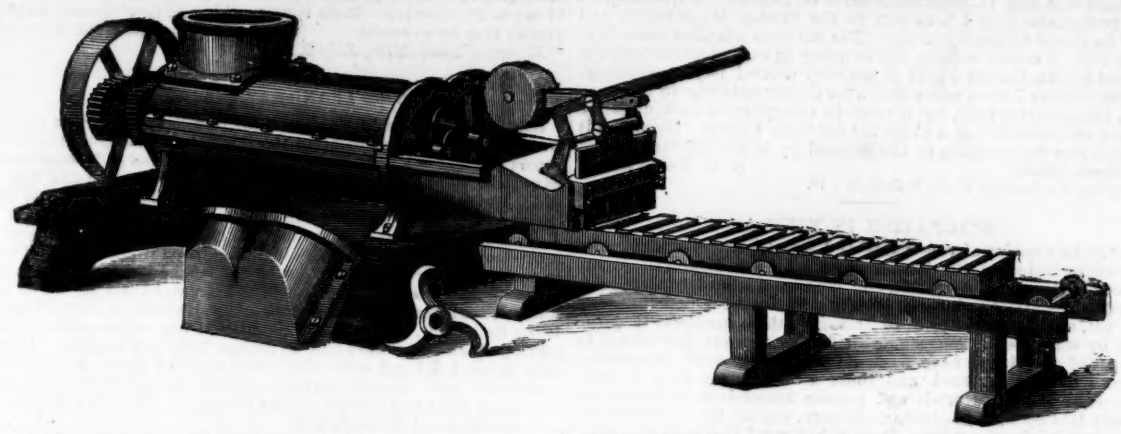
Mr. WADDINGTON said he went to Cornwall every month, and he would be very happy to visit Penstruthal too. (Hear, hear.)

It was stated that a meeting would be convened shortly to decide whether the scheme could be carried out, or the company reconstructed.

The meeting then closed with a vote of thanks to the Chairman and directors.

[For remainder of Meetings, see to-day's Journal.]

IMPROVEMENTS IN THE TREATMENT OF PEAT.



IMPROVEMENTS IN THE TREATMENT OF PEAT.

Although the value of peat fuel for the generation of steam owing to its great heating power is admitted, especially for metallurgical purposes, from its freedom from sulphur and general purity, it has not hitherto come largely into use in this country in consequence of certain obstacles to its economic manufacture. One of the greatest difficulties in connection with the utilisation of peat deposits has been the evaporation of the moisture contained therein, which under favourable circumstances will average 75 per cent. This must be done by the atmosphere, as no means of generating heat sufficiently cheap to expel so large a proportion of liquid to solid matter has yet been devised which could compete with it. No mechanical contrivance can squeeze it out, for it is like a sponge, ready to reabsorb moisture from the air or surface in which it is in contact, whereas its behaviour when dried in the air in this respect is considerably altered, whilst as a matter of cost and superiority of the finished product it is immeasurably superior. Notwithstanding this, it has been found possible to improve the condition of the peat for drying by treating it by machinery, to assist largely its power of evaporation, by entirely destroying its sponge-like property by bleeding every fibre so as to set free the water, which is held in suspension by the air tubes and cells, &c. By cutting up into infinitesimal small lengths every particle of root the entire moisture is left on the outside, or so mixed that its expulsion becomes more perfect and rapid than by any other known process of mastication—kneading, or bruising, or crushing.

The machine illustrated above is the invention of Mr. HALL, of the Savile-street Foundry, Sheffield, and was designed with a view of producing a denser and firmer peat for the production of charcoal for various smelting and metallurgical processes, and an efficient system of drying the peat by the atmosphere, assisted by the waste heat of combustion and carbonising, was carried out, the principle involved being that of inducing currents of air through the drying sheds by the variations which could be produced by differences in temperature and moisture. It is not necessarily heat that is required to dry it, but the use of large quantities of air set in motion, which by passing over the moist peat engages the water and carrys it away. The machine consists of a hopper secured at one end of a double barrel casing, which for convenience of inspection is divided horizontally along its centre line, the upper half being hinged to the lower. In this casing work two coarsely pitched continuous screws, geared together by spur gearing, one with right and the other left-handed thread, revolving at equal speeds at about 16 revolutions per minute. Both these screws are hollow, and through each passes a high speed cutter shaft, having a three-bladed curved cutter keyed thereon, similar to those used in chaff cutting machines. These are driven by a pulley at the other end of one of the shafts, and revolve about 200 times per minute, the two high speed shafts being coupled by equal spur wheels, as shown, and rotating towards one another. The cover is partially removed to show the position of these cutters with respect to each other and the diaphragm plate immediately in front, through which the peat is forced by the screws and cut up into minutely short pieces by the cutters acting against the cross-bars, similar to the action of an ordinary chaff-cutting machine against the mouthpiece.

The peat thus minced up is forced out by the continued action of the screws through the orifice shown, and delivered upon the trays, being cut off into suitable lengths by the balanced reciprocating cutter shown over the delivery holes. The high speed of the cutter shaft is reduced on to the screw shaft by means of differential gear. An eccentric is forged upon the central or high speed shaft, bearing a 12-toothed pinion gearing into a surrounding internally toothed wheel with 13 teeth. The amount of throw given to the eccentric is such that the diameters of the two pitch lines in the wheels exactly coincide all round, and as there is one tooth less in the pinion the outer wheel moves forward in the same direction by exactly the distance equal to one tooth, or at a speed 13 times slower. In practice the machine is found to be capable of performing a large amount of work very effectively and without clogging. All the motions are self-cleansing, the screws, as well as the cutters, clearing each other. The resulting briquettes are as dense and as solid as can be desired.

SIR JOSEPH WHITWORTH'S PATENT FOR IRON AND STEEL.—On Tuesday, before the Judicial Committee, an application was made that the petition of Sir Joseph Whitworth be heard before the vacation. Eventually the Court ordered it to stand for November, and if Sir Joseph Whitworth was under the necessity to leave England for his health his evidence could be taken before the registrar of the Court.

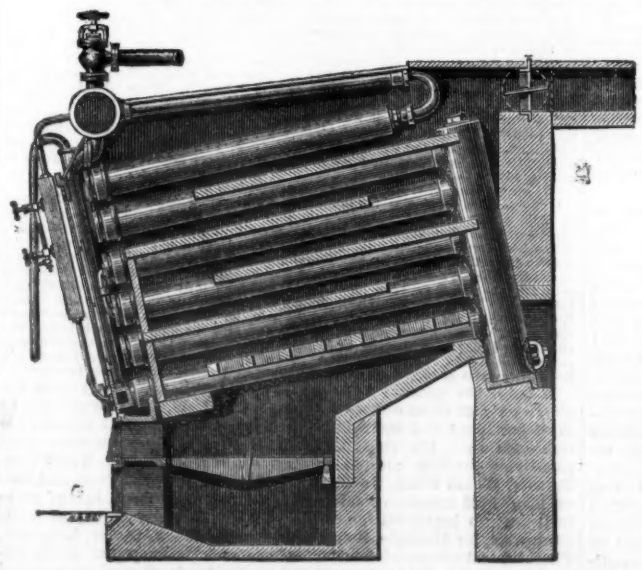
ARTIFICIAL FUEL.—The invention of Mr. O. HASSEL, of Heidelberg, Germany, consists of the manufacture of artificial fuel in form of bricks or blocks out of peat, coal dust, and other combustible materials in combination with sea-grass, sea-weed, sea-fan, or similar vegetable substances, and in combination with a coating of pitch or other suitable material. One or more of the above-named vegetable substances is or are boiled in water to a jelly, which is then carefully mixed with the combustible material in a powdered state that has to be formed into artificial fuel until a pasty mass is obtained. The mixture is compressed in moulds of suitable size into bricks, which are dried in the open air. After the bricks have sufficiently hardened the same are furnished with a coating of pitch or other suitable material to form a strong protecting surface against atmospheric influence.

SALE OF STREAM WORKS.—On Wednesday last Mr. Alexander Berryman, of Penzance held an auction at Mrs. Abraham's hotel, Camborne for the sale of what are known as Perry's Stream Works. Although the lease of the property expires in a little over two years from the present time, it was stated that the lord would be willing to renew it to any purchaser of whom he approved, and it having been mentioned that a profit of 500*l.* was made on the last twelve months' working, the bidding for the property was exceedingly brisk. Mr. T. W. Field started it in 1000*l.*; but this figure was doubled by Mr. Lanyon. Mr. H. P. Vivian followed with 2100*l.*; Mr. Lanyon, 2500*l.*; Mr. Vivian, 2800*l.*; and Mr. Lanyon, 2800*l.* After 3000*l.* had been reached, Mr. Tangye joined in the bidding, with another 100*l.*; Mr. Lanyon added 50*l.*, and Mr. Rabling 50*l.* on this. Mr. Tangye next made the bidding 3250*l.*; Mr. Lanyon, 3260*l.*; Mr. Rabling, 3270*l.*; and Mr. Lanyon, 3300*l.*, at which sum the property was sold. It was said that this about 700*l.* above the reserved price.—*Cornish Telegraph.*

HOLLOWAY'S OINTMENT AND PILLS—SELF HELP.—In sickness it was a momentus matter to find an easy, ready, and reliable remedy for outward disfigurations and inward disorders before the inestimable discovery of these preparations. No invalid need now be at a loss for successfully managing ulcers, sores, tumours, boils, bruises, sprains, &c. Enveloping Holloways medicine are very intelligible printed directions for using them, which should be attentively studied and immediately followed by the application of his treatment. Sooner or later the sufferer will assuredly triumph over the worst diseases. This searching ointment disperses all those malignant humours which aggravate many diseases of the skin, and often prevent the cicatrization of ulcers, and ever kindle inflammatory tendencies in the system.

JOHN WILLIAMS AND CO.,
WISHAW, SCOTLAND,
MANUFACTURERS OF ALL KINDS OF
Cut and Lath Nails; Joiners', Moulders', and Flooring Brads; Copper and Zinc Cut Nails; Colliery Plate Nails; Washers, Boiler Plates, Tube Strips, Sheet Iron for Galvanising and other purposes.
PRICE LIST ON APPLICATION.

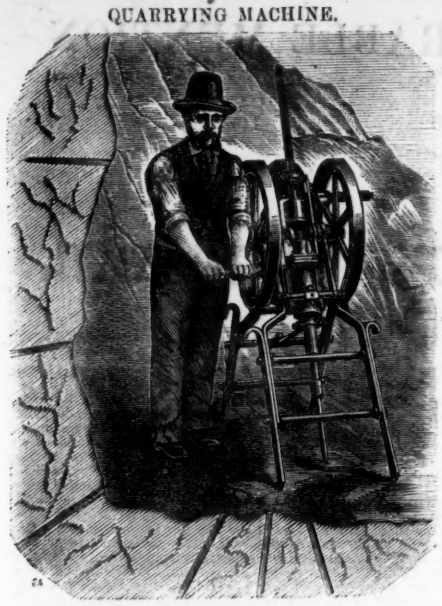
BARROW
SECTIONAL BOILER.



These Boilers will be exhibited in Steam at the
ROYAL AGRICULTURAL SHOW,
KILBURN,
ON AND AFTER JUNE 30TH.
TOGETHER WITH COMPOUND EXPANSIVE ENGINES, DESIGNED SPECIALLY TO EMPLOY THE HIGH-PRESSURE STEAM PROVIDED BY THE BOILERS.

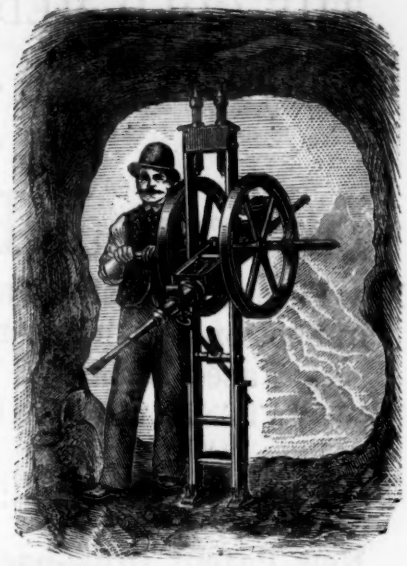
For particulars, apply to the—
BARROW SHIPBUILDING CO.
BARROW-IN-FURNESS.
Or at their London Office,
MILDMAY CHAMBERS, UNION COURT, OLD BROAD STREET, E.C.

QUARRYING MACHINE.



HAND-POWER ROCK DRILL COMPANY, LIMITED.

TUNNELLING MACHINE.



FOR THE

LATEST TESTIMONIALS AND REPORTS OF PRACTICAL WORK

APPLY TO

T. B. JORDAN, SON, & MEIHE,

63, QUEEN VICTORIA STREET,

LONDON, E.C.

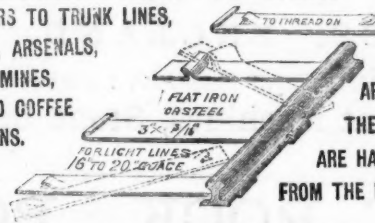
JORDAN'S PATENT "DEAD-BLOW" HAND-POWER ROCK DRILL.

PATENT GOLD REDUCING MACHINERY AND GENERAL MINING PLANT.

A NARROW GAUGE RAILWAY —LEGRAND'S PATENT— COMPLETE IN TWO PARTS, From £250 per Mile.

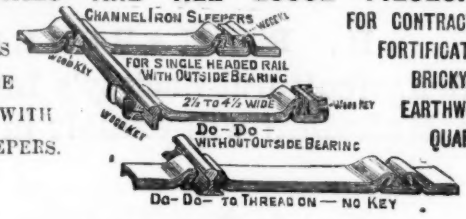
WROUGHT IRON SLEEPERS TO FIT ANY RAIL, DISPENSING WITH SPIKES AND ALL LOOSE PIECES.

FOR FEEDERS TO TRUNK LINES, QUAYSIDES, ARSENALS, FORESTS, MINES, SUGAR AND COFFEE PLANTATIONS.



THE OUTSIDE CLIPPING SLEEPERS ARE LAID FIRST, THEN THE INSIDE SLEEPERS ARE HAMMERED UP AS FROM THE DOTTED LINES.

OVER 1000 MILES OF LINE ARE NOW LAID WITH THESE SLEEPERS.


CHANNEL IRON SLEEPERS
FOR SINGLE HEADED RAIL WITH OUTSIDE BEARING
2½ TO 4½ WIDE
Do- Do- WITHOUT OUTSIDE BEARING
Do- Do- TO THREAD ON — NO KEY

FOR CONTRACTORS, FORTIFICATIONS, BRICKYARDS, EARTHWORKS, QUARRIES.

SOLE AGENTS, **SHAW BROTHERS,** BIRMINGHAM.

DRAWINGS & PARTICULARS ON APPLICATION. TO SAVE TIME, PLEASE GIVE GAUGE, WEIGHT OF RAIL AND KIND OF TRAFFIC.

MAY AND MOUNTAIN,

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Engineers, Millwrights, Ironfounders, Coppersmiths, and Boiler Makers.

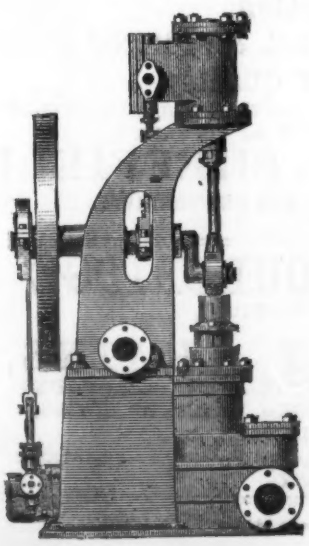
SOLE MANUFACTURERS OF

IMPROVED VERTICAL DOUBLE-ACTING

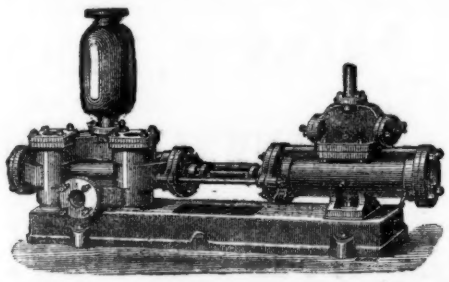
STEAM PUMPS,

MADE IN ALL SIZES AND COMBINATIONS.

PRICES ON APPLICATION.



COLEBROOK'S PATENT STEAM PUMP.



PRICES OF A FEW LEADING SIZES.

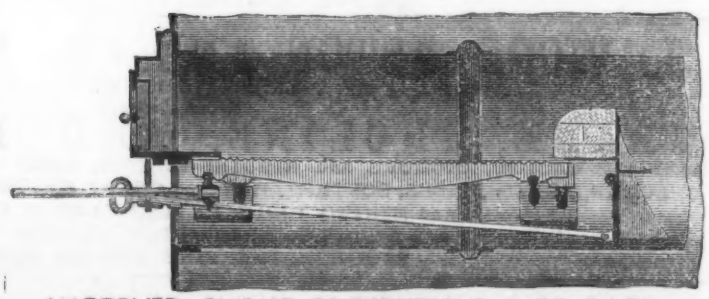
Steam cylinder.	Water cylinder.	Stroke.	Gallons per hour.	Price.
3	1½	12	720	£16
4	2	18	1,260	19
4	4	18	5,040	25
6	4	18	4,280	33
6	6	18	9,660	41
8	6	18	7,920	50
10	8	18	12,060	80

Reliable and Economical—Short Pistons and Long Strokes—Slide Valve worked by Steam alone, without Tappets, Levers, or Valves.

Adapted for all purposes and to all circumstances.

TORKINGTON & HEY'S PATENT LUBRICATORS,

Entirely Self-acting. Flow of Grease regulated by the Steam. Perfect Lubrication. Greatest possible Economy.

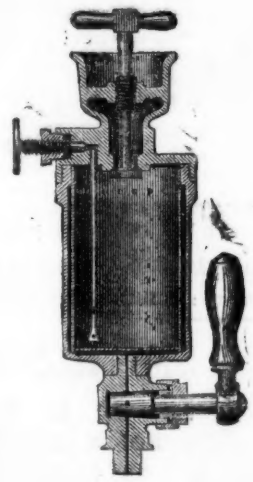


IMPROVED SMOKE PREVENTING FIRE BARS.

TO SUIT ANY FLUE OR FURNACE.

PRICES ON APPLICATION.

TORKINGTON AND HEY'S PATENT.



PRICES OF LUBRICATORS.

No.	Horse-power.	Price.
1	Agricultural Engines...	7s. 6d.
2		10 0
3	5 to 7	20 0
4	7 10	25 0
5	10 20	30 0
6	20 30	37 6
7	30 50	47 6
8	50 70	60 0
9	70 100	85 0
10	100 200	110 0

At the PARIS EXHIBITION the Jurors have Awarded
THE GOLD MEDAL, THE SILVER MEDAL, AND HONOURABLE MENTION
FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

H. R. MARSDEN,

ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

Improved Patent Stone Breakers & Ore Crushers.

New Patent Reversible Jaws, in Sections, with Patent Faced Backs.

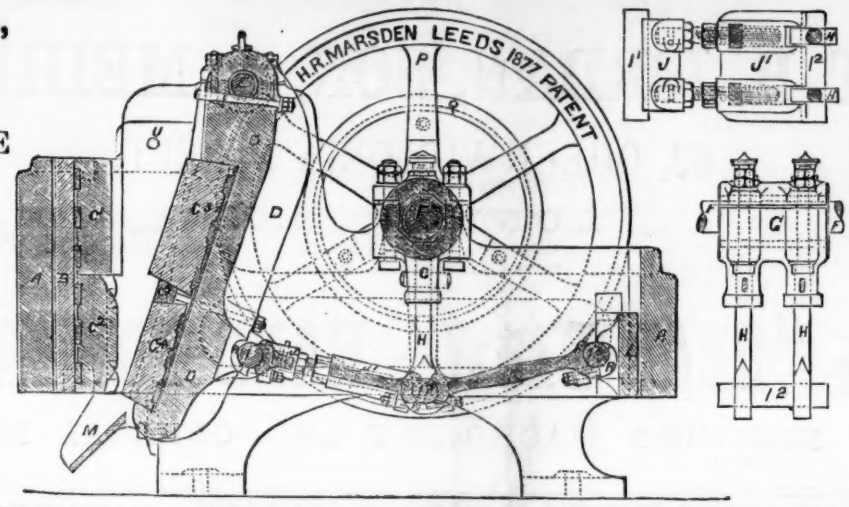
NEW PATENT ADJUSTABLE TOGGLES.

OVER **2500** IN USE.

New Patent Draw-back Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

70 PRIZE MEDALS.



READ THIS—

Wharthole Lime Works, Maryport, Whitehaven, November 7, 1873.

H. E. MARSDEN, Esq., Soho Foundry, Meadow-lane, Leeds.

DEAR SIR,—The machine I have in use is one of the large size, 24 in. by 12 in. The quantity we are breaking daily with this one machine is 250 tons, the jaw being set to break to a size of 2½ in. We have, however, frequently broken over 300 tons per day of ten hours, and on several occasions over 360 tons during the same period. The stone we break is the blue mountain limestone, and is used as a flux in the various ironworks in this district. We have now had this machine in daily use for over two years without repairs of any kind, and have never had occasion to complain of any inconvenience in using the machine. I hope the one you are now making for me may do its work equally well. The cost—INCLUDING ENGINE-POWER, COALS, ENGINEMAN, FEEDING, and all EXPENSES OF EVERY KIND—is just 3d. per ton. Should any of your friends feel desirous of seeing one of your machines at work, I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,
WILLIAM MILLER.

AND THIS—

Wharthole Lime Works, Aspatria, Cumberland, July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.

DEAR SIR,—We are in receipt of your letter of 4th inst. I may just state that the stone breaker above named has been under my personal superintendence since its erection, and I have no hesitation in saying that it is as good now as it was five years ago.

I am, dear Sir, yours faithfully,
FRANCIS GOULD.

GREATLY REDUCED PRICES ON APPLICATION.

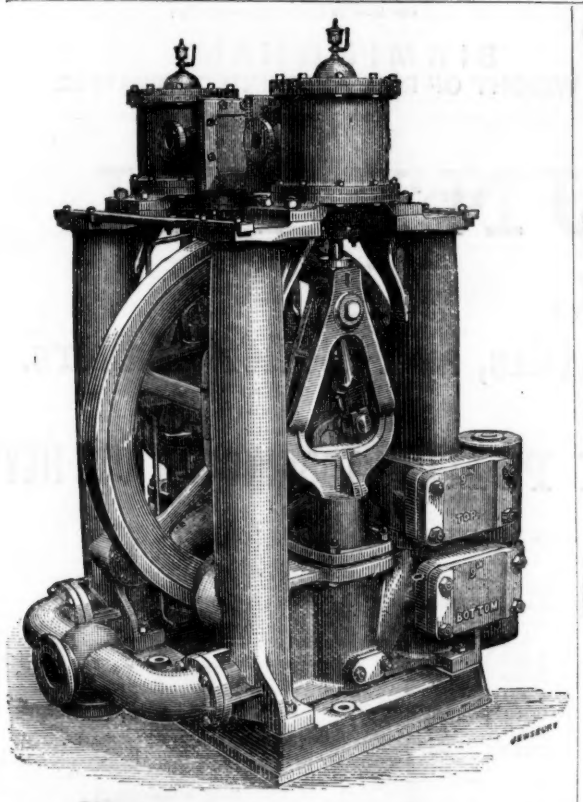
ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

Royal Agricultural Society's International Exhibition, Kilburn, London—JUNE 30 TO JULY 7 INCLUSIVE. STAND 457.

H. R. MARSDEN will exhibit in full operation SEVERAL of his Patent Machines, Stone Breakers, and Ore Crushers.



STEAM PUMPS for COLLIERY PURPOSES, specially adapted for Forcing Water any height; also for Sinking; and for Feeding Boilers.

JOHN CAMERON has made over SIX THOUSAND.

WORKS: OLDFIELD ROAD, SALFORD, MANCHESTER.

SMITH & FORREST,

OIL REFINERS,

ROSIN OIL DISTILLERS,

GREASE AND VARNISH MANUFACTURERS,

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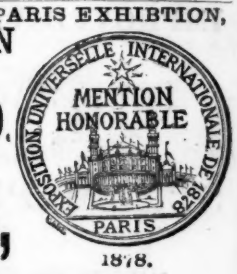

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